

# Stable matching with uncertain linear preferences \*

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We consider the two-sided stable matching setting in which there may be uncertainty about the agents' preferences due to limited information or communication. We consider three models of uncertainty: (1) lottery model — in which for each agent, there is a probability distribution over linear preferences, (2) compact indifference model — for each agent, a weak preference order is specified and each linear order compatible with the weak order is equally likely and (3) joint probability model — there is a lottery over preference profiles. For each of the models, we study the computational complexity of computing the stability probability of a given matching as well as finding a matching with the highest probability of being stable. We also examine more restricted problems such as deciding whether a certainly stable matching exists. We find a rich complexity landscape for these problems, indicating that the form uncertainty takes is significant.

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\*joint work with Haris Aziz, Serge Gaspers, Ronald de Haan, Nicholas Mattei, and Baharak Rastegari. Paper available from <https://arxiv.org/abs/1607.02917v1>